

North Carolina Science and Technology Research Center Research Triangle Park, NC 27709

A unit of the North Carolina Department of Commerce

FINAL REPORT ON A

REGIONAL TECHNOLOGY TRANSFER PROGRAM

North Carolina Science and Technology Research Center

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Period Covered: January 1, 1979 - December 1979

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P. J. Chenery, Director

Contract NASW-3055

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ABSTRACT

NC/STRC has served the southeastern U. S. for 16 years as an Industrial Applications Center for NASA. This report, covering CY. 1979, discusses proliferation of online searching capabilities among its industrial clients, changes in marketing staff and direction, use of Dun and Bradstreet marketing service files, growth of the Annual Service Package program, and services delivered to clients. The Center's former Library Search Service has been reactivated and enlarged, and a survey was conducted on the NC/STRC Technical Bulletin's effectiveness. Several quotations from clients assess the overall value of the Center's services.

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Section I

BACKGROUND AND HISTORY

The N. C. Science and Technology Research Center (NC/STRC) has been under continuing contracts to the National Aeronautics and Space Administration (NASA) since 1964 for operation of an technology application center. NC/STRC is one of six Industrial Applications Centers (originally known as Regional Dissemination Centers) and serves nine southeastern states. It is funded by NASA, the state of North Carolina, and user fees. Administratively, it comes under the Division of Economic Development, N. C. Department of Commerce.

By action of the N. C. General Assembly in 1963, NC/STRC is located in the Research Triangle Park, roughly equidistant from Raleigh (state capital and home of N. C. State University), Durham (setting of Duke University) and Chapel Hill (home of The University of North Carolina). Both geographically and by policy, it is closely allied with the three Triangle universities, state government, the Research Triangle Institute, and other Park tenants.

NC/STRC occupies one wing of the Science and Technology building (of which it is landlord) and shares common-usage areas such as conference rooms with the Triangle Universities Computation Center (TUCC) the N. C. Energy Institute and the N. C. Educational Computing Service.

During the days of batch searching, NC/STRC used the TUCC facilities, progressing from straight linear tape runs to an inverted system using disk packs which permitted random access. Now that almost all searching is done on-line, NC/STRC uses the following:

- TI Silent 700 Electronic Data Terminal
- Sperry Univac UTS 400 data terminal with printer
- Hazeltine 2000 terminal with printer
- Hazeltine digital tape cassette recorder
- Perry Electronics Data Terminal Model PE 9000 with printer

One textile file, from the Institute of Textile Technology, is still searched by batch processing at TUCC. TUCC facilities are also used for grading the U. S. Power Squadron seamanship exams and the inhouse accounting system.

In April 1979, NC/STRC acquired by lease-purchase agreement an Addressograph-Multilith 425 Word Processing System. This is used for all reports, proposals, technical papers, and to set type for the monthly newsletter NC/STRC Technical Bulletin (see page 10). A new and updated program diskette will permit accumulation and retrieval of marketing data; merging of names, addresses and other variable terms into form letters; and maintenance of a master file of text for printed forms and marketing material for easy updating.

The professional staff of NC/STRC is composed of engineers, scientists, and information specialists with both industrial and academic backgrounds. The marketing section has undergone total revision during this contract period with the retirement on June 30 of Lem Kelly as assistant director for marketing, the appointment of J. Graves Vann as his successor, and the appointment of Dr. James Earl Vann to fill the vacancy left by the resignation of Howard Bridges some months previously. (A "freeze" on hiring within state government has caused some positions to remain vacant for an indefinite period.) A full discussion of these changes and their effect on NC/STRC's marketing program will be found in Section III beginning on page 5.

During this contract period, the professional staff consisted of the following:

- P. J. Chenery, director
- A. W. Lockwood, chemist and textile specialist
- Mary M. Metter, research librarian specializing in medical and business information
- C. Leon Neal, mechanical and aeronautical engineer specializing in solar energy research
- Monica Nees, Ph.D., director of technical services, specializing in medicine, pharmaceuticals, and organic chemistry
- T. R. Potter, electronic engineer with special interest in biomedics

F. O. Smetana, Ph.D., professor of mechanical and aeronautical engineering at N. C. State University and consultant to NC/STRC on special projects

James Earl Vann, Ph.D., adult education, program development specialist; marketing

Graves Vann, Jr., (no relation) ceramics and metallurgy; marketing

Philip Wilson, education and administration information; business officer

Blaise Roncagli, a doctoral candidate in chemistry with an extensive background in computers, serves on a part-time basis as programmer, replacing C. Philip Ford who resigned in May to accept a position with industry. Ms. Sylvia Johnston, industrial engineer, resigned in February to move with her husband to Kentucky.

See Appendix I for technical staff biographies.

Section II

MARKETING

NC/STRC's entire marketing program, which did not include many major policy changes over the past few years, has undergone almost complete restructuring during this contract period.

On June 30, 1979, L. M. Kelly, who had been the Center's first assistant director for marketing retired and was succeeded by J. Graves Vann, Jr., senior engineer in ceramics and metallurgy. Vann had already been with NC/STRC some 15 years - in fact, since its inception - and is thoroughly familiar with both the territory and the Center's operations. Just prior to Kelly's retirement, a long-standing vacancy in that section was filled by the appointment of Dr. James Earl Vann as assistant marketing representative, thus introducing two new personalities to the marketing scene.

(The inevitable confusion arising from having two J. Vanns in marketing - they are not related - will be somewhat eased in this report by referring to the assistant director for marketing as "Graves Vann" and the new appointee as "Jim Vann.")

Because of the divergence in approach to the marketing effort between Kelly and Graves Vann, this section will be divided chronologically into two parts: Part I. Kelly: January 1 - June 30, 1979; and Part II. Vann: July 1 - December 31, 1979.

PART I. KELLY: January 1 - June 30, 1979

From January 1 until Jim Vann joined the agency in mid-April, 1979, Kelly was responsible for marketing throughout a nine-state southeastern region. The normal problems associated with being a one-man team were augmented by the geographical extent of the territory, distance between widely-separated industrial centers and their inaccessibility except by car, and the traditional production-oriented nature of most manufacturing plants in the Southeast. Until recently, major research facilities and company headquarters were normally located in the northeast and midwestern regions; labor-intensive plants were operated in the south.

However, over the past 12 years this has changed to some degree. Kelly made routine visits to both clients and potential clients in this area, and the Center has benefited from cordial relations with most of the major industries located here.

SOUTH
MAGAZINE

A major boost to the marketing effort during this period was the publication in SOUTH magazine for February 1979 of an article on services to industry provided by NASA's Industrial Applications Centers and highlighting NC/STRC. Written by free-lancer Jerry DeLaughter, it brought a number of requests for additional information from readers throughout the Southeast. NC/STRC purchased 1000 reprints of the article and these, accompanied by personal letters, were sent to selected industries and people throughout this territory. The response has been very good, and other freelance writers are being contacted with the hope of broadening this type of exposure. (Appendix II)

HIGH-
TECHNOLOGY
INDUSTRY
STUDIES

In addition to Kelly's regular marketing program the Center undertook, during the first half of the year, a special project which may affect the Center's marketing some years ahead. At the request of the state's Business Assistance Division, two members of the NC/STRC staff began studies of the possibilities for attracting into North Carolina certain types of high-technology industry with high growth potential.

Dr. F. O. Smetana, assistant director for special projects, conducted a search of the NASA file to find those companies involved in the field of robotics. He also studied a printout from a similar search conducted for a client on the Engineering Index file. The two databases revealed a total of 17 companies in the United States that are actively engaged in some facet of robotics. By studying the abstracts of papers published by these companies, Smetana was also able to determine their primary activities.

According to Smetana, North Carolina's technical manpower, lower energy costs, and lower manufacturing costs may entice some of these companies to move at least their manufacturing facilities into this state, thereby providing NC/STRC with new business prospects.

Another study, this one by T. R. Potter, electronics engineer, centered on electronic communications. Potter scanned material from electronics journals over the past three years to isolate factors which will affect this market. Satellite communications, data communication, fiber optics, speech recognition and synthesis are those areas of electronic communications which, according to Potter, show the highest growth potential.

Information contained in reports on these two studies should help the Business Assistance Division draw fairly accurate inferences as to the companies' potential interest in relocating in this state.

For the 18 months preceding Kelly's retirement, Graves Vann had assumed responsibility for marketing in the Atlanta, Georgia, area in addition to his regular engineering duties. Although it is generally assumed that Atlanta and a 100-mile radius surrounding it comprise the major economic center in the Southeast, Graves Vann reported that his analysis of the market for NC/STRC services revealed two major facts:

ATLANTA REGION

1. that most companies located here are primarily production or distribution centers for companies headquartered elsewhere; and

2. that qualified potential clients in the Atlanta region are most likely to be found among fairly new local and regional industries just now reaching the R&D stage.

With acquisition of the AMTEXT 425 word processing system in April 1979, it was possible to store data on potential clients in its memory bank and retrieve it by geographical locations (using ZIP codes), alphabetically by company name or major contact, and by SIC. Because of his familiarity with and concentration on this one area, Graves Vann decided to use the Atlanta metropolitan area as a test program to set up a system whereby a staff member could quickly obtain a list of potential clients in any given small area and/or by type of industry. Included with the listing would be mailing address, phone number(s), date and type of all previous contacts. Once this program is worked out and debugged, other major centers (for instance, the Richmond-Petersburg, Virginia; Greenville-Spartanburg, South Carolina, areas) will be

WORD PROCESSOR

added gradually. Unfortunately, it will work best only if constantly updated, and this may prove somewhat of a stumbling block because of priorities and access to the system.

In June, the Center acquired a portable data terminal which the marketing personnel can use for demos and presentations. The last few weeks of Kelly's service was spent in helping Jim Vann to become familiar with the overall marketing scene as well as turning over immediate business to Graves Vann.

PART II. VANN

July 1 - December 31, 1979

The first order of business for the wholly-new marketing staff was the development of a comprehensive marketing plan. Combining some old tried-and-true methods with some promising new ideas, Graves Vann drew up a marketing plan that placed heavy emphasis on careful and selective prospecting.

Although one-on-one selling, featuring a demonstration when possible, still is the most effective marketing approach, restrictions on travel imposed by state regulations and fuel prices/shortages have highlighted the urgency of prequalifying potential clients to the greatest possible degree. The plan leans heavily on D&B marketing service files to first identify possible clients which are then screened by several means (state manufacturing directories, past experiences with them, newspaper and magazine articles, etc.) and the corporate profile fleshed out with all pertinent data. Marketing literature and a personal letter precede a telephone call requesting an appointment. Such prequalifying has been relatively successful over the short time period it has been in force.

EXPANDED RESOURCES

Fortunately, the addition of many new files made available through Lockheed, SDC and other commercial information banks has greatly expanded NC/STRC's market. With access to data on banking, finance, economics, foreign markets, social sciences and the humanities, the agency is now serving banking institutions and other organizations previously outside our subject areas. This also broadens the sources from which to draw prospects. The Dun and Bradstreet marketing services has, with

the addition of other databanks, become a chief source of contacts in banking, finance, economics, management, and allied fields. James Vann, drawing on his background in management, organization, and education, is primarily responsible for contacting these prospects; Graves Vann, a ceramics and metallurgical engineer, concentrates on the more technically-oriented clients.

NASA's advertisement in the October 8, 1979, issue of BUSINESS WEEK magazine (page 261) drew only a few inquiries for NC/STRC; all were answered by printed material, personal letter, and a telephone call, but no specific business has resulted to date.

BUSINESS WEEK

The marketing staff has promoted the Annual Service Package (ASP) concept in all its selling efforts. Although slow at first to gain acceptance among established clients, it is now well received and enthusiastically used by ASP clients. By providing almost unlimited services and eliminating costly, time-consuming financial arrangements for each job, the ASP frees both client and Center to concentrate on the research job rather than administrative details.

The year was closed out with decided gains in prospecting, selling, and program organization. An updated edition of the Center's Catalog of Computer Searchable Information Resources is being written and is scheduled for release by mid-to late Spring. A broad-brush introductory marketing piece is also being drafted.

UNIVERSITY PROGRAM

Since 1967, NC/STRC has sponsored, in one form or another, a subsidized program aimed at graduate students. In the early years, when it was known as the "Graduate Student Program," students worked on an individual basis with NC/STRC staff members. Only four databases - NASA, GRA, ITT, and ERIC were available to them at the low, subsidized price of \$15 per file searched.

The cost of continuing the program in this manner could not be justified, and, in the early '70s, NC/STRC restructured the program, held training sessions for university librarians so student could work through them, and one more file

(WTA) was added. This eliminated the need for Center engineers and scientists to spend time developing search strategies, and for much of the travel formerly required. At one point, some 35 libraries in the Southeast were participants in the program. As online search terminals and commercial information resources become available, more and more libraries chose to do student searching inhouse and requests fell off. It was also during this period that Ms. Becky Walker, who had been involved with the graduate student program from its inception and had spearheaded the effort through its various stages, left the agency. Between her departure and the inhouse search capabilities being developed in the universities, the program declined rapidly and it was decided to phase it out as no longer needed.

From 1978 until the summer of 1979 NC/STRC continued to provide graduate student searches to those libraries still participating, but no effort was made to promote the program, train additional librarians, or widen the database offerings.

UPGRADED SERVICES

In April 1979, Ms. Mary Metter, a former research librarian from the University of North Carolina at Chapel Hill joined the staff (see biography Appendix I), and the Center once again had a staff member interested in and aware of the problems faced by thesis and dissertation writers. She proposed enlarging the databases available to the students, stressing quality searching guided by an expert at NC/STRC, and putting the price structure on a direct-cost basis. Memoranda of explanation on the new upgraded service were sent to librarians throughout the region (Appendix III), and the response has been good. Total number of searches processed for students in 1979 rose by 59% over 1978.

Two major differences in student requests under the new program have surfaced: the expansion of interest areas from heavily educational into psychology, business, and biology; and the concentration of most of the search requests in North Carolina institutions. (Formerly, other states used the service much more than did North Carolina.) One other area of activity is Chicago-by-way-of-Florida. A faculty member from the University of Sarasota in Miami, who also teaches at DePaul University in Chicago, was so impressed with

a search he received from NC/STRC that he has referred many of his graduate students here.

PUBLICATIONS

NC/STRC uses two regularly scheduled publications to help keep its name and image before clients, prospective clients, government officials, and just friends. Many libraries, we have found, maintain complete files of all issues of one or both and use them as reference works.

TECH TOPICS is a quarterly newsletter designed as a throwaway. Its contents over four issues (one year) are divided fairly evenly between the Center and its companion agency, the N. C. Board of Science and Technology. Aimed at the busy researcher, administrator, professor, or manager, it offers brief articles on current scientific and/or technical innovations, status reports on outstanding research projects, announcements of new publications, conferences, and information databases. Each issue also features a NASA Tech Brief.

TECH TOPICS

The NC/STRC Technical Bulletin is a monthly review and digest of recent reports, articles, conference proceedings, and other publications which the staff, in their daily work, have encountered and judged better than average in usefulness. Most of the items cited are available in company and university libraries (all TB has done is draw the reader's attention to them); others can be obtained from NTIS or the U. S. Government Printing Office. In the few cases where a reader cannot locate a copy himself, it can be ordered through NC/STRC at cost-plus-handling.

TECH BULLETIN

Orders for TB documents have been declining slowly since the state adopted legislation prohibiting the distribution of regularly-scheduled publications unless specifically requested. Although "subscriptions" are solicited each year and business reply cards are provided for that purpose, the required annual purge causes the loss of 30%-40% of the readership of each publication, at least initially. A given percentage will, each year, write somewhat indignant letters demanding to know why they have not received any issues since ... and often cite a date several months or a year in the past. They also frequently request that all intervening issues be provided as soon as possible.

Document orders from TB also may have dropped off because of other factors: rising cost of document reproduction and handling, a drop in the number of items abstracted in each issue, and a shift in the subject categories offered.

READERSHIP SURVEY

To test the validity of this last possibility, the editor conducted a survey of TB readership, including in the August issue questions on subject matter, style, format, and ancillary offerings such as annual indexes. A copy of this survey, which was designed to be a self-mailer, can be found in Appendix IV.

A listing of possible subject areas in which they would like to see more offerings brought the following ratings:

Do-it-yourself ideas	61%
New ideas from inventors (by way of patents)	52%
Energy substitutions	50%
Solar energy	49%
Energy supplies	40%
New materials	39%
Management information	33%
Environmental problems	32%
Production technology	32%
Canned computer programs	29%
Electronics	21%
Medicine	20%

Subjects drawing less than 20% interest included: personnel management, toxicology, tools, physics, chemistry, economics, plastics, numerical analysis, mind-benders (fun-and-games, usually mathematical), industrial hygiene, numerical control, and materials flow. (This information has been useful to both the editor, T. R. Potter, and to the marketing staff.)

As to explanatory material, that is, expanded digests of each item, 39% wanted more, 8% less, and the rest (at least those who bothered to check it) thought it just right as it is. Seventy-one percent of the readers would like to see conferences, workshops, and seminars announced; 51% would appreciate an order form for documents included with each issue, and 54% also voted for an annual index.

On the question of usefulness of the cited documents to the reader, the replies contradicted an assumption long held here. For several years, marketing had believed that the bulk of TB clients were ordering documents which were of interest and/or value to them only in extracurricular activities. For instance, a man at a large company might order a document dealing with the curing of concrete, but, when a marketing representative called on him with the idea of expanding that interest into a full search, it was found that the reader's concern was for his soon-to-be poured driveway at home.

However, on the survey question dealing with ultimate value of TB listings, 58% of the readers said they found the material very useful on the job; 58% also checked "useful for general information," and only 24% said they found it useful for home and hobby activities.

In separate comments, over half of those responding (a large 23% of the readership) voiced strong approval of TB's present format, coverage, and editorship.

The single most popular document offered through the Technical Bulletin in 1979 was Regional Guidelines for Building Passive Energy Conserving Homes, HUD-PDR-355, underscoring the nation's concern in this area. The entire subject of gasohol was also very popular and a number of orders were received for such reports as Status of Alcohol Fuels Utilization Technology for Highway Transportation, N79-13790, and Comparative Economic Assessment of Ethanol from Biomass, HCP/ET-2854.

Other major areas of interest, as indicated by orders received, were coatings, the flammability of fabrics, and solar thermal applications.

As might be expected from the TB mailing list, over half of all document orders came from industry. Another 24.5% originated in universities and technical institutes. Individuals with no known affiliation accounted for 7.5% of all orders, while governments (mostly state) and research institutes tied at 4.5% each.

Section III

SERVICES TO CLIENTS

In its infancy (1964-65), NC/STRC had one main service to offer clients - retrospective searching of the NASA database and monthly updating of searches on single topics, plus backup documentation in limited quantities and an occasional workshop or seminar. Clients, mostly small electronic companies or medium-size manufacturing firms, were few and not very demanding. Gradually, as computerized information retrieval progressed from linear batch searching to more sophisticated methods and as databases increased in size, scope, and number, the Center's services expanded to provide one-stop information shopping for clients ranging from billion-dollar-a-year industries to individual backyard entrepreneurs.

Today (1979) the number of services provided has not increased as much as the depth and breadth of the basic ones. Retrospective searching is still the main stock-in-trade but the number of databases which can be accessed has grown to over 150; subject areas have expanded to include "almost anything anyone has ever written about," as one staff member remarked; and the number of reports or documents that can be reviewed has mushroomed from some 3.5 million to over 40 million.

A retrospective search can be either broad or narrow in scope and can cover one year or many, but in general it is a comprehensive look at all the available pertinent documentation on a particular subject from the present time back to (1) the beginning of the computer-indexed file or (2) as far as the client wishes to go within the coverage of the database(s) being searched. (If needed, a manual search of material prior to computerization of the file can be made.) NC/STRC specialists talk with each client at length to insure a complete and accurate understanding of exactly what is needed. This refined "question" is then posed against one or more files (predetermined by agreement between the client and the information specialist) via an online computer terminal hooked up to vast information resources across the nation.

RETROSPECTIVE
SEARCHING

The specialist, having a background in both the subject area and the specific databases being used, constantly modifies and reworks the strategy chosen to retrieve only those items which fit

exactly within the agreed-upon parameters. Most databases provide a bibliographic abstract of each item, but some (NASA, Institute of Textile Technology, and World Textile Abstracts, for instance) provide only accession numbers. These numbers must then be matched with identical numbers on abstracts in an inhouse file to provide the bibliographic data needed by a reviewer.

Once reviewed and approved by the NC/STRC information specialist, search results are sent to the client with a letter of analysis. Sometimes the specialist will include recommendations for improving the search strategy (use of more databases, expanding or restricting the strategy, looking at parallel or peripheral material). An order form for documents and a search appraisal form are also enclosed.

During this contract period, search requests rose about 9% over the preceding period. Some of this activity comes from annual service package clients who tend to be heavy users once they are committed, but as only 28% of the total number of searches run were for such clients, it is apparent that other types of clients are also using the services more heavily than in the past.

FILE USAGE

Originally, search questions were all on engineering or scientific subjects most of which were covered in the NASA literature. Later, with the addition of education files (ERIC), the Government Reports Abstracts (GRA), Chemical Abstracts, textile files, and the introduction of the Graduate Student Program in 1968 (see page 8), questions expanded into other fields. Today, many search questions are still on engineering and scientific topics, especially as related to toxic substances and carcinogens, but many more are on marketing, advertising, personnel (motivation, training, safety), human relations, management, history, and other far-from-scientific subjects. The staff believes that these are the direct result of intensified competition, reduced margins of profit, and an increase in the number and availability of management studies and compilations.

Despite the many new databases accessible, the most heavily used files continue relatively the same. In order of use these are:

Chemical Abstracts	World Textile Abstracts
Engineering Index	ERIC
MEDLINE	National Technical In-
NASA	formation Services
Institute of Textile	INSPEC and TITUS
Technology	PREDICASTS

For those clients whose needs cannot be met by computer searching, NC/STRC employs two manual searchers on an "as needed" basis. Both searchers are doctoral candidates in chemistry at Duke University and conduct (primarily) manual searches of the older Chemical Abstracts journals.

NC/STRC's continuing specialization in textiles is clearly reflected in the list above, although textile file usage actually declined during this contract. The most apparent cause of this is the rapid proliferation of inhouse literature searching capabilities, especially among the larger firms. With few exceptions, these companies have invested in both the terminals and the training for their staff to search Lockheed, Systems Development Corporation (SDC), and Bibliographic Retrieval Services (BRS) databases. Although this has undeniable advantages to the company, disadvantages include cost of supporting such a capability and lack of the broader, interdisciplinary expertise backed by industrial experience available at centers such as NC/STRC.

TEXTILE QUESTIONS

On the brighter side is the fact that a number of these companies are coming to NC/STRC for help on extremely difficult (and therefore more costly) searches as well as during periods of overload. Some companies have also told the Center that they can secure documents more quickly and less expensively from here than through more public sources. This is true, they say, even when the document in question has been identified through their own research efforts.

NC/STRC also continues to be the only source for the ITT database (other than the Institute itself) and therefore responds to a number of requests for both retrospective searches and current awareness profiles. Although ITT is several months behind in supplying tapes to update the profiles, NC/STRC continues to provide more current awareness service on textiles and textile-related subjects than on any other single topic.

Many other industries besides textiles are investing in inhouse search systems. (One question marketing is studying is the criteria on which this decision is based: company size, interests [diversity and fields], financial status, organization, progressiveness, frequency of need, etc. As inhouse capabilities become more prevalent, what complementary or supplementary services should NC/STRC offer?)

CURRENT AWARENESS

Akin to retrospective searches but serving a different purpose are the current awareness profiles. Designed to keep a client current with everything happening in a particular field, these are regularly scheduled updates of one or more databases on the same topic over an extended period of time, usually 12 months. One staff member supervises 32 custom-tailored profiles, all in the area of textiles, and in January 1980 will add 21 standard profiles on that general subject using the GRA/NTIS file. Other bases used for profiles are AGRICOLA, the American Society for Metals (ASM) file, BIOSIS, Engineering Index, INSPEC, MEDLINE, NASA, and PREDICASTS. Several more specialized databases have been used on a trial basis; the ones listed above are those recurring over a period of a year or more.

DOCUMENTS

Full documentation for items cited in bibliographies, plus other unrelated document requests, constitute a major activity at NC/STRC - although not a major source of income as they are sold at cost plus handling fee. Many reports (about 40%) are readily available either inhouse or from local sources such as libraries at the three Triangle universities (Duke, North Carolina and North Carolina State). Various agencies of the federal government supply another 30%. The remainder are secured from other U. S. sources such as the National Library of Medicine and Linda Hall Library at Kansas City, Missouri (15%), foreign sources (5%), and the originating source (author or publisher), about 3%.

TECH HOUSE PLANS

In the Fall of 1976, NC/STRC was designated the official distribution center for full sets of plans for the NASA Tech House, a full-scale model home illustrating potential technology applications in the house of the future. By April 1977, the

first sets of reproductions were ready for delivery. Both NASA and NC/STRC announced their availability, and the orders began to arrive. Continuing promotion, plus occasional references in trade journals, airline and architectural magazines, has brought the total number sold to 1050. For statistical purposes, these sets are included under "Documents," and account for 265 or 16% of the total 1897 sent out in 1979. Plans sell for \$10 per set, including handling and postage.

Other type of documents, in order of popularity, were:

Ns and As

Articles

Institute of Textile Technology reports

Engineering Index

World Textile Abstracts

Chemical Abstracts

Food Science & Technology Abstracts

National Technical Information Services

Educational Research Information Council

Agricola

Section IV

PROFESSIONAL MEETINGS AND CONFERENCES

Peter J. Chenery

- June 3-5 Association of Information and Dissemination Centers in Ottawa, Canada.
- June 11-13 Represented North Carolina at the annual meeting of the National Governors Council on Science and Technology in Louisville, Kentucky.
- June 19-22 NASA Industrial Application Center directors, New Orleans, Louisiana

Arthur W. Lockwood

- May 17-18 21st Annual Meeting of Textile Information Users Council, Clemmons, North Carolina.
- September Attended BRS, Lockheed, and SDC workshops.
- October 25-27 Textile Information Users Council Fall Meeting in Alexandria, Virginia.

Mary M. Metter

- February 22-23 North Carolina Online Users Group Group Workshop in Research Triangle Park, North Carolina.
- October 9 Instructed North Carolina Public Information Officers on using NC/STRC services
- December Attended a meeting on Interlibrary Loan Practices at Burroughs Wellcome Co. in Research Triangle Park, North Carolina. Procedures for borrowing materials from four medical libraries (UNC-Chapel Hill, Duke, Bowman-Gray, and ECU as well as National Library of Medicine) were set.

December 7 Attended MEDLINE Update in Research Triangle Park, North Carolina.

C. Leon Neal

January 24-25 Attended DOE/RECON Users Meeting in Oak Ridge, Tennessee.

May 27 - Presented a paper at the 1979 ISES
June 1 Silver Jubilee International Congress in Atlanta, Georgia.

Monica Nees

September Attended the American Chemical
10-13 Society meeting in Washington, D.C.

October 19-21 Attended Governor's Conference on Library and Information Services in Raleigh, North Carolina.

December Elected Alternate Councilor for North Carolina Section of American Chemical Society.

Attended quarterly meeting on Inter-library Loan Practices. (See Metter above.)

Doris Schroeder

April 23-24 Attended two-day seminar on "Public Relations in the '80s: A Forecast" at the University of North Carolina Institute of Government in Chapel Hill, North Carolina.

J. Graves Vann, Jr.

February Represented NC/STRC at information resources workshop held in conjunction with EPA Region IV Conference, Atlanta, Georgia.

WORKSHOPS and EXHIBITS

In addition to the professional conferences, meetings and seminars attended by staff members, the Center sponsored several workshops and exhibits.

Professional Engineers of North Carolina annual meeting, Winston-Salem, North Carolina, February 15-16, 1979. NC/STRC used an updated System 70 display as a background for a portable terminal demonstration of computerized information retrieval. L. M. Kelly, assistant director for marketing, and C. Leon Neal, specialist in solar energy, represented the Center. Although the opportunity to talk with the 275-300 engineers normally attending was considered a good marketing opportunity, the results were disappointing. Very few PE's visited the exhibitions which were physically separated from the meeting rooms and gathering areas.

"Progress in Research," Cary Village Mall, September 14-15, 1979. Cary, a suburb of Raleigh, serves as a "bedroom" for faculty at North Carolina State University as well as many organizations in the Research Triangle Park. The new mall, a large commercial venture in an otherwise small town, attracts a different audience than other malls in the Raleigh area; e.g., a larger-than-normal proportion of engineers, scientists, professors, and other professional people. Other exhibitors at this event included the Research Triangle Institute, Burroughs Wellcome Co., and Midwest Research Center. NC/STRC again used the System 70 display which features both the NASA Tech House and NC/STRC services. An order was placed for a telephone installation to permit use of the portable terminal for demonstration but was cancelled because of technical difficulties. Several staff members alternated in talking with visitors and handing out marketing literature.

Society for Technical Communication Carolina meeting, NCSU Faculty Club, Raleigh, North Carolina, January 4, 1979. Ms. Becky Davidson, reference

librarian and coordinator of automated reference services at the University of North Carolina-Chapel Hill Medical School Library was featured speaker at this meeting of the local chapter of the Society for Technical Communications. In developing the topic, "Computer Search Services -- Where to Locate and How to Use," Ms. Davidson used NC/STRC as an outstanding example of a complete service center.

Health Care and Delivery Online Workshop, NC/STRC, Research Triangle Park, North Carolina, September 26, 1979, and

Medical Center Library, University of West Virginia, September 27, 1979.

Ms. Mary Metter, information specialist at NC/STRC, taught both sessions of this workshop for representatives of National Library of Medicine Centers in the Mid-Atlantic region. The course centered on use of MEDLINE, HEALTH, and NTIS databases in searching questions on public health, preventive medicine, and health care.

Articles

Several articles appearing in outside publications were effective in bringing inquiries and business to NC/STRC:

Automation in Housing, November-December 1978 issue, brought in Tech House orders: "NASA Tests Space Research in Real Home Environment," pp.22,24.

RTItems , December 1978
"Who's Who in the Park"

Tar Heel Wheels, February 1979 issue, p. 13, Vol. XXXVI, No. 2

North Carolina Commerce Report, January 1979
"Agency Offers Research Help"
"Research Triangle Park Directory"
"Free Publication (TB)"

Intergovernment Personnel Notes, January-February 1979
"Update: Tech House Survivors End Year-Long Experiment"

South Magazine, February 1979

"Business Taps a Vast Space Databank"

Business Week ad, October 8, 1979, p. 261 - four inquiries

C. Leon Neal, NC/STRC applications engineer in mechanical and aeronautical engineering, has been specializing in solar energy for the past several years. His publications in this field for 1979 include:

RESIDENTIAL PASSIVE SOLAR ENERGY COMPETITION FOR NORTH CAROLINA, Final Report, November 1, 1978 - April 9, 1979, 70p., available from North Carolina Energy Institute, Research Triangle Park, North Carolina 27709.

SURVEY OF SOLAR ENERGY SYSTEMS NOW OPERATING IN NORTH CAROLINA - February 1979, N. C. Solar Energy Association, May 1, 1979, 11p.; coauthored with Mary Jane Boren Meeker.

SOLAR ENERGY IN NORTH CAROLINA CIRCA June 1979, ISES Silver Jubilee Conference, On the Rise, Atlanta, Georgia, May 28-June 1, 1979.

RESIDENTIAL SOLAR ENERGY DESIGN COMPETITION FOR NORTH CAROLINA, Proceedings of the 4th National Passive Solar Conference, Kansas City, October 3-5, 1979, pp. 87-88; coauthored with Donald W. Barnes.

Section V

IMPACT CASES

NC/STRC's sister organization, the N. C. Board of Science and Technology, was reorganized by the 1979 General Assembly to increase its effectiveness and upgrade its role in the state's economic growth. The newly appointed members have been especially interested in the interaction of the Center with those responsible for industrial development. NC/STRC was therefore asked to supply a list of clients who could be contacted for an evaluation of our services. All responses but one were favorable to the Center and include the following remarks:

"A key point about the staff at STRC is that the people know what they are talking about, are knowledgeable in their field of interest. Thus, they can narrow down their search and weed out inapplicable information." The reply went on to state that the company had used other NASA centers but has found that the North Carolina Center is the best. (Black and Decker)

* * *

"Major search on solar energy was done, including a broad spectrum of alternatives: wind, biomass, photovoltaic, solar, thermal, etc. Made extensive use of NASA resources and provided a very comprehensive report. This information is currently being used by our headquarters in Idaho. We couldn't have done this without the support of NC/STRC." (Morrison Knudsen Corporation)

* * *

"We regard this Center as the only Center set up to provide aluminum abstracts in the form we desire. (We) could set up own in-house functions of this nature, but do not do so because (we) believe the Center is better qualified to do the work than Reynolds Metals is."

* * *

Comments from H. Marvel, E. I. du Pont de Nemours & Company, Wilmington, Delaware: "North Carolina is the only place providing (us) abstracts of specific research in which we are interested. We are

particularly concerned with certain types of textile research. In the case of the abstracts provided, this is not a question of economics; the North Carolina Center is simply the only place from which abstracts of the type desired can be obtained. Obtaining abstracts through the Center is of course considered to be less expensive than seeking to operate our own system in this regard."

* * *

Noting that services from NC/STRC had helped the company in several instances, i.e.,

- pointed them in the right direction to solve a problem on metal fatigue;

- flagged several important items on new technology in textiles, thereby helping them stay competitive;

- focused their attention on points which resulted in their resolving a problem with adhesives;

the Technic Engineering Corporation concluded by saying:

"We consider this a very valuable service. We wish we could use it more frequently. We definitely go to the center before going to library. We believe this is a very good use of public funds and encourage continued expenditure of tax dollars for such purposes."

* * *

The single critical reply was from Allied Chemical in New York. Their only "complaint" by their own admission was that searches usually required two weeks, although never more than that. Suggestions for improved services were somewhat vague but included an allusion to providing many more information services, and that "a sensitivity to business-oriented information and customer satisfaction should be cultivated." The response ended with the following:

"Against all this, however, is the undoubted competence and conscientiousness of the NC/STRC (personnel) with whom we have come into

contact. These people provide the interface and NC/STRC owes much of its success to their dedication."

* * *

An unsolicited letter of appreciation came to the Center from the law firm of Bell, Seltzer, Par & Gibson in Charlotte, North Carolina:

"This is a short note to express gratitude for the excellent service and assistance provided to us by your institution in locating and developing prior art for use on behalf of Air Knife, Inc., the party whom we represented in litigation with Scaglia, S.P.A. The proceeding has been settled on terms which we believe to be very favorable to Air Knife, including the saving of a substantial sum of money. We believe the efforts of your institution contributed significantly to the results thus achieved."

A. W. Lockwood was the NC/STRC specialist on this account.

* * *

Gilbarco of Greensboro, a long-time client, sent NC/STRC the following excerpt from an in-house memo:

"Over the past ten years North Carolina Science and Technology Research Center (NC/STRC) has provided information services to Gilbarco on an 'as-needed' basis. Often, their services were requested in a 'rush' effort to resolve an existing problem, or to be certain we had covered the entire area of a particular new technology. In every case they presented us with a thorough study and helped provide us with a comprehensive grasp of a new technology or state-of-the-art.

"A few examples of past studies they have performed for us include electronic assembly technology; investigation of thermally stable, rain erosion resistant protective materials; fundamentals of fluid sealing; automation trends; and fiber optics. The cost of individual information searches varies depending upon the area involved and the applications desired; however, it generally ranges from \$100-\$500/study. The cost of

any NC/STRC service is at least 75% less than we would pay any private information agency for the same service."

* * *

Brownell Enterprises in Clanton, Alabama, was seeking information on airfoils that unload themselves when approaching stall toward the development of a stall-proof and spin-proof airplane. The data on tests of airfoil sections was thought to be in old NACA documents, but help was needed to locate them. Dr. F. O. Smetana recommended:

TR 824 "Summary of Airfoil Data"

"Theory of Wing Sections," Abbott and von Doenhoff; McGraw-Hill

He also recommended several more recent publications:

CR 3135 "Extended Analytical Study of the Free-Wing/Free-Trimmer Concept"

CR 2208 "A Design Study for a Simple-to-fly, Constant Altitude Light General Aircraft" (Smetana, NCSU)

CR 2946 "Analytical Study of a Free-Wing/Free-Trimmer Concept for Gust Alleviation and High Lift"

CR 2046 "Application of Unconventional Wing Pivoting About Span-Wise Axis Forward of the Aerodynamic Center for Gust Alleviation in General Aviation Aircraft"

The inquirer, not a paying client, was referred to the University of Alabama Library for copies of these documents.

APPENDIX I

TECHNICAL STAFF

P. J. CHENERY, director

B.S. Engineering Sciences, Harvard University; research associate, M.I.T. Sperry Gyroscope Co.; director of research and manager of contract products, Wright Machinery Division. Holder of four patents in automatic flight control equipment and one in textile machinery.

Southern Interstate Nuclear Board (past chairman and N.C. delegate); National Governors' Council on Science and Technology (vice chairman and N.C. delegate); Association of Scientific Information Dissemination Centers (past president); American Association for the Advancement of Science; American Society for Information Science; Institute of Electrical and Electronics Engineers (senior member).

KELLY, Lem M.

B.S., applied mathematics, Henderson State Teachers University, Arkansas. Graduate of the Command and General Staff School and other Army service schools. Five years with Army Research and Development program. With NC/STRC since 1967.

LOCKWOOD, Arthur W.

B.S. in chemistry, Furman University. Seventeen years industrial experience in synthetic fiber research and development. Patents and publications in the field of man-made fiber production. With NC/STRC since 1967.

METTER, Mary

B.A., Psychology, University of Rochester, N.Y.; MSLS, library and information science, University of North Carolina, Chapel Hill. Five years at Health Sciences Library, UNC, as coordinator, automated reference services. With NC/STRC since 1978.

NEAL, C. Leon

B.S., mechanical engineering, N.C. State University; M.S., aeronautical engineering, Purdue University; graduate work in interdisciplinary studies and research, State University of New York at Buffalo. Eight years industrial experience, Cornell Aeronautical Laboratories. With NC/STRC since 1969.

NEES, Monica

B.S., chemistry and M.S., organic chemistry, Roosevelt University; Ph.D., organic chemistry, University of Maryland. Four years of college and university teaching. Ten years in information retrieval. With NC/STRC since 1972.

POTTER, T. R.

B.E.E., N.C. State University. Ten years industrial experience in radio and electronics design and as product engineer manager. With NC/STRC since 1966.

SMETANA, F.O.

B.M.E., and M.S. in mechanical engineering, N.C. State University; Ph.D., University of Southern California. Vice President, Philcord Co.; flight test analyst, Douglas Aircraft Co., and U.S. Air Force research scientist, University of Southern California Engineering Center; professor of mechanical and aerospace engineering, N.C. State University. A total of 27 years research design, and test experience. Author of more than 100 publications on aeronautics, energy, and fluid mechanics. Has received numerous grants for research in these areas. With NC/STRC since 1966.

VANN, J. Graves, Jr.

B.S., ceramics and M.S., metallurgy, N.C. State University. Seventeen years industrial experience in metals, food processing, ceramics, and management. With NC/STRC since 1964.

VANN, James E.

B.S., Zoology, and M.A. Education, Duke University; Ed.D., N.C. State University. Four years in industrial management; ten years in educational administration, college level; ten years as adjunct professor at N.C. State University, graduate courses in adult education. With NC/STRC since 1979.

WILSON, Philip R.

A.B., political science, The University of North Carolina. Six years with U.S. Navy as airborne communications officer and navigator. With NC/STRC since 1976.

Research

APPENDIX II

ORIGINAL PAGE IS
OF POOR QUALITY

From North Carolina,
NASA research is available
for business application.



Specialists processing a databank search for information for an industrial client.

Business Taps A Vast Space Databank

By Jerry DeLaughter

More than 1,000 southern companies have learned that the U.S. space program has a down-to-earth meaning at North Carolina's Research Triangle Park.

It's the romance of space that gets headlines — footprints on the moon, probes of planets, sophisticated satellites by the dozen. But the earthly spinoff from America's race into space can supply pragmatic answers to terrestrial problems of private industry.

The Science and Technology Research Center (STRC) is the southern link in a vast computer-library network sponsored by the National Aeronautics and Space Administration (NASA). With their keyboards in North Carolina, specialists can lay electronic hands on selected research studies from 90 data bank-libraries in the U.S. and 23 foreign countries.

Anyone needing the latest word on shoes or ships or sealing wax can find it, fast and cheap, at the NASA center. The service is "one of the real achievements of the space program," says NC-STRC director Peter J. Chenery.

D. W. Barlow of Tampa is one who

found help at the Center. "It cost me \$100," he said, "and would have been a steal at any price."

Barlow was manufacturing hydraulic truck lifts in 1974 when he became intrigued by similarities between his manufacturing process and fabrication of solar energy-collecting plates. He wanted to know more.

He had read about NASA's Spinoff program and its Industrial Applications Centers (IACs). "So I wrote to NASA and they put me in touch with the people in North Carolina."

Leon Neal, applications engineer at STRC and a solar energy specialist, searched the computers for expertise and sent the results to Tampa. "The stuff came by the pound," Barlow recalls. "It was full of solid information. In fact, I still re-read it and get something new every time."

The help he got led to his turning Suncoast Truck Equipment Company over to his son and forming a new firm — O.E.M. Products — to manufacture Solarmatic Systems. "It's the best information buy we could have ever made," Barlow said. "I don't know how else we could have managed that

kind of research."

Barlow's dilemma — finding a pertinent needle in the haystack of technological data that grows daily — is itself a space-age spinoff.

America's Great Leap Forward in the 60s, its "giant step for mankind," spawned a technological revolution affecting life from test-tube conception to brain-wave death. Ninety percent of all scientists who ever lived are working now. By one conservative estimate, 20,000 new pages per day are being added to data libraries, virtually every one of value to somebody.

Frequently they are in business or industry, like the boat manufacturer needing hull paint that would resist scraping on rocky shores. Or officials in Louisiana distressed by gas leaks which caused explosions, wanting to find portable gas detectors. Or the builder facing construction on land that didn't meet percolation standards, who sought guidance on closed water-recovery systems.

The information explosion, director Chenery said, "makes it difficult or impossible to get at information we may need by manual search."

The Space Act of 1958 which created NASA also requires "the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."

Dissemination means in part NASA's Technology Utilization program. From any of seven regional IACs like the one in North Carolina, clients

can, for the cost of retrieval, share in new developments and discoveries almost as fast as they're recorded.

The North Carolina center is primarily responsible for queries from Virginia, the Carolinas, Georgia, Alabama, Tennessee, Mississippi, Louisiana and Arkansas. Two new state-level IACs — at the University of Florida at Gainesville and the University of Kentucky at Lexington — have begun operations under NASA contracts.

The non-profit service is designed to "bring ideas and people together," Chenery says. It makes modern technological research — including exotic (and expensive) research done for the space program — inexpensively available to anyone with an idea, a need or a curiosity.

Earth-bound innovators are, quite literally, pounding plowshares and pruninghooks from metals designed for space vehicles. The spinoff has produced pacemakers, smoke detectors, better football helmets and golf clubs, concert guitars, artificial limbs, Alaskan pipe lines and trash compactors.

The North Carolina keyboards provide access to far more than space research, however. NASA's own research makes up less than 10 percent of the documents on file.

Computer-libraries available to STRC personnel include 90 computerized collections covering subjects ranging from abrasives to zymurgy, all indexed and cross-cross-indexed.

Computer agility makes the apparently impossible task manageable. According to Doris Schroeder, STRC director of communications, "Chemical Abstracts Condensates, for instance, contains approximately three million records, and can be reviewed in its entirety on a single question in less than two minutes."

The pertinent source for a particular search might be any one or several of the databanks available. Since each search is a custom job, client relationships are diligently personal, as D. W. Barlow discovered.

Leon Neal, after providing bibliography "by the pound," saw a Dow Corning demonstration of new paint for solar collectors while at a meeting in Colorado.

Neal told Barlow about the paint, and Solarmatic now mixes its own based on guidance he got from Dow Corning.

The STRC, a North Carolina state agency since 1963, bases its charges to clients on actual cost of the service. Support funds come from the state and

One company executive started a new business and company from research obtained from the NASA center.

from NASA. Typical costs of a single-source inquiry range from about \$85 to \$125.

Computer information retrieval was inevitable, given the need and the capability. As technical consultant J. Graves Vann Jr. puts it, the sudden eruption of scientific research "has created a considerable lag between the laboratory bench and practical application. We just can't adapt overnight to the frontiers we're walking on with our present scientific knowledge."

The IAC network, Vann said, seeks to close the gap.

Although it pioneered the service, NASA doesn't have the information-retrieval field to itself. Independent systems, including large companies with their own in-house computers, are beginning to appear. Even those frequently call on the more broadly capable — and often cheaper — IACs, however.

According to Vann, "We're getting more and more requests in the so-called 'soft' sciences — personnel and management, government, sociology, psychological testing."

But most inquiries are technological. Three-fourths of the center's queries come from industry. Individuals, government agencies, institutions and libraries account for the rest.

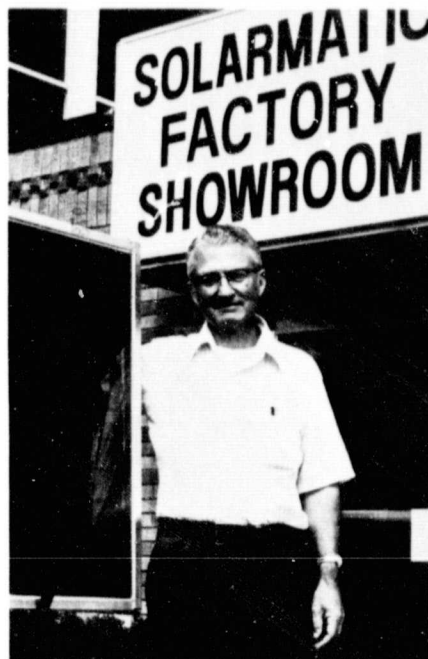
Demonstrating "conversation" with the computer about an inquiry, biochemist Monica Nees of the center staff posed a question: "Let's say you're dealing with wide-scale application of a pesticide, and you want to know what to expect."

She punches the hieroglyphic keyboard. The readout on a TV screen, printed simultaneously on paper, says: "HELLO. THIS IS CASIA [or whichever index she chooses]. GO AHEAD."

By pursuing key words — toxicity, animals, livestock, residual — Dr. Nees quickly narrows the subject to learn

where, how much and what kind of information is available. Further consultations will customize the bibliography, and any abstracts or complete copies needed are provided.

"We have to work down both avenues," Vann said, high recall and high relevance. "The businessman is usually less interested in 100 percent recall than in fewer well-defined items



D. W. Barlow: Reports a resounding success story by using the space databank.

on which to hang his hat."

Information retrieval is no longer a "new toy," Chenery said, but "a tool absolutely essential for thoroughness in almost any profession. What we're trying to do is provide complete, exhaustive and timely information on technology, management, marketing, production, whatever."

"In short, to make ideas move and generate products." S

Jerry DeLaughter is a North Carolina based free lance writer.

APPENDIX III

North Carolina Science and Technology Research Center

LIBRARY SEARCH SERVICES

The N. C. Science and Technology Research Center (NC/STRC) is an information center which has offered low-cost computer searches to students for many years. Since 1967, a few of our many files have been available to students under a program subsidized by NASA and the state of North Carolina. Searches on ERIC, NASA (aerospace), ITT (textiles), NTIS (government reports), and FSTA (food science and technology) provided under the special program cost the student \$15 for 100 unreviewed references. To assist in the services, many librarians in the Southeast were trained by our staff members to prepare search strategies which then were sent to NC/STRC for batch processing using our in-house tapes.

In the decade since the program began, computerized literature

searching has grown in scope, content, quality, and quantity. Searches are no longer processed in batches with the analyst forced to wait for results before evaluating the strategy. Now, sitting at a terminal, an analyst can evaluate the quality and quantity of output and make modifications as needed before requesting any references to be mailed. This has led to far greater flexibility and precision in searching. Databases have also proliferated and expanded; now there are well over 100 files in science, technology, social sciences, humanities, and business. NC/STRC has been searching these files for its industrial clients but, until recently, has not offered this wealth of information to students because of the limits placed on the LSS. These have now been lifted.

EXPANSION OF SERVICE

Under the new program, students will be able to receive a search on any database that the Center has access to. Searches at NC/STRC are handled by subject specialists who are familiar with both file content and structure. (Contents vary distinctly, and vocabulary choice often has to be modified while the analyst is at the terminal.) For these reasons, librarians will no longer be required to write the search strategies. We would prefer that librarians continue to thoroughly interview the student and then forward the request to the Center for processing. The student's name and telephone number should be included in the request since questions on scope and comprehensiveness often arise.

ELIGIBILITY

Any student at an institution of higher education may have a search prepared under the LSS program. Faculty members, researchers, and administrative staff members may also request searches but not under this subsidized program. Our full rates apply to any individual who is not a student.

CHARGES

Under the LSS, students will be charged only for direct cost: online time, printing, postage, and pro-rated staff time. Price ranges for several common databases appear below. Remember that these are only approximate costs. The final cost is substantially affected by the comprehensiveness and complexity of the search. These aspects, along with a maximum cost should always be discussed with the student. There will be a minimum charge of \$10 per student request.

DATABASES	SUBJECT COVERAGE	APPROX. COSTS
AGRICOLA	agriculture	\$15 - \$25
ERIC	education	"
ITT	textiles	"
MEDLINE	health sciences	"
NASA	aerospace	"
NTIS	government reports	"
ABI/INFORM	business, management	\$25 - \$35
BIOSIS	life sciences	"
CHEMICAL ABSTRACTS	chemistry	"
COMPENDEX	engineering	"
DISSERTATION ABSTRACTS	dissertations	"
FSTA	food science	"
HISTORICAL ABSTRACTS	history	"
PSYCHOLOGICAL ABSTRACTS	psychology	"

APPLICATION PROCEDURE

There is no subscription fee for using the services of NC/STRC. The only costs are those incurred for a specific request. Any library or student who does not have ready access to online information retrieval - or even to a specific database - may contact us for a search. The enclosed brochure contains a listing of available databases. New ones are being added all the time; call us if you do not see a listing for a particular subject, and we can tell you what file is best. In submitting requests, the

attached request sheet may prove helpful. While we do not require you to use this sheet, we do need all the information it asks for. Using this or a modified version will assist the requester in formulating the questions and also provide us pertinent information such as name and mailing address. Many students and librarians prefer to telephone their requests. We encourage this because it produces more pertinent searches and is also faster. On the average, it takes two weeks from the time we receive a request until the student has the results in hand.

APPENDIX IV

TECHNICAL BULLETIN QUESTIONNAIRE

DEAR READER: Every once in a while we get to wondering how we might make the TECHNICAL BULLETIN more useful to you. Here's your chance to tell us! Check the appropriate columns, refold, staple, and put in the mail. That's all there is to it.

1. Please put an X in the () beside the subject areas(s) you would like to see expanded.

() Do-it yourself	() Production technology
() Medicine	() Electronics
() Environmental problems	() Tools
() Energy supplies	() Solar energy
() Energy substitutions	() Management information
() Plastics	() Industrial hygiene
() Economics	() Personnel management
() Materials flow	() Physics
() Canned computer programs	() Chemistry
() Numerical control	() Toxicology
() Numerical analysis	() New ideas from inventors
() New materials	(by way of Patents)
() Mind benders	
2. Should each item announced by accompanied by more ___ or less ___ explanatory material?
3. Should we announce conferences, workshops, and seminars of interest? Yes ___ No ___
4. Would it be useful to include an order form with each issue? Yes ___ No ___
5. Would you find an annual index of any help? Yes ___ No ___
6. Do you find the items in TECHNICAL BULLETIN more useful to your ___ job, ___ home and hobby activities, or ___ general information?